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PRELIMINARY STUDIES ON STONE FRUIT TREE VIRUSES IN ALGERIA

B. Aouane

Institut Technique de l'Arboriculture Fruitière et de la Vigne (ITAF),
Département du Laboratoire Central, Tessala El Merdja-Birtouta-GG, Alger (Algeria)

SUMMARY - Sanitary surveys have been limited for stone fruit crops in Algeria. Laboratory tests (ELISA) were used to identify: *Prunus necrotic ring spot virus* (PNRSV), *Prune dwarf virus* (PDV) and *Apple chlorotic leaf spot virus* (ACLSV). Additional surveys are needed to have a clear picture on the presence of virus and virus-like diseases in our stone fruit industry, with particular reference to *Plum pox virus* (PPV).

Key words: Algeria, fruit trees, plant viruses, ELISA.

RESUME - Ces dernières années, en Algérie, les espèces fruitières à noyau ont fait l'objet de quelques enquêtes visant l'évaluation de leur état sanitaire. Des tests de laboratoire (ELISA) ont permis d'identifier: *Prunus necrotic ring spot virus* (PNRSV), *Prune dwarf virus* (PDV) et *Apple chlorotic leaf spot virus* (ACLSV). Toutefois, des enquêtes supplémentaires s'avèrent nécessaires pour déterminer l'éventuelle présence de maladies de type viral, notamment le *Plum pox virus* (PPV).

Mots-clés: Algérie, espèces fruitières, virus végétaux, ELISA.

INTRODUCTION

Stone and pome fruit crops are crucial importance in the framework of our national fruit industry. With a surface of over 86,000 ha in 1993, these orchards grew to 104,710 ha in 1999. Production was 276,136 tons with an average yield ranging from 5 to 6 tons/ha.

These yields are however considered very low, in respect to production potentials. The reasons for this situation are: (i) bad sanitary status of existing orchards, established with plant material of doubtful origin and (ii) wrong choices when establishing new orchards (choice of the site, variety, pollinator and rootstock).

The distribution of species in Algeria is largely due to: (i) land and climatic trends; (ii) altitude variations, and (iii) irrigation and cropping techniques.

Table 1. Fruit crop cultivation and production in Algeria

Species	Surface (ha)	Production (tons)
Apple	12,260	86,903
Peach	12,800	56,286
Apricot	18,770	53,419
Pear	10,220	39,681
Plum	6,700	26,014
Pomegranate	3,810	22,813
Almond	30,440	21,516
Medlar	2,850	19,327
Cherry	2,860	4,123

Source: M.A. DSAEE 1997

SANITARY STATUS OF FRUIT ORCHARDS

Virus diseases affecting *Rosaceae* have great economic impact due to the considerable number of susceptible species and to the damages, both in terms of quantity and quality of fruit. Hence, demands for certified plant propagative materials have increased considerably on both domestic and international markets.

In Algeria, after the restructuring of the sector of agriculture, evolving from self-management to privatisation of agricultural lands, farmers wanted to produce rapidly and at the lowest possible cost, and therefore renewed or established new orchards without paying too much attention to the sanitary status of plant material used. The most dangerous fruit tree pests were viruses causing decline, spreading by the practice of vegetative propagation, currently used.

In view of the sanitary nature of the issue, the Institute of Fruit Trees and Grapevine (ITAF) in the 1980s started a series of measures to improve the quality of the Algerian fruit industry. Research on fruit tree virus diseases began, although few steps have been made in the identification and characterisation of fruit crop viruses.

In addition, new propagating materials were being introduced with the support of foreign research institutions (French, Belgian and German). More source materials have therefore been available, to create a foundation block complying with the best production standards. In addition, equipment and permanent control strategies have been implemented.

Surveys

In our field surveys, the objective was to assess the status of viruses in peach and apricot trees. A total of 106 samples was collected in the wilayates of the Centre, East and West of Algeria. The collected material was ELISA tested at ITAF laboratory for: PPV, PNRSV, PDV and ACLSV.

Viruses identified

PNRSV was the most common virus, detected in peach and apricot trees grown throughout. The symptoms on apricot trees were mosaic spots on leaves. The distribution of symptoms was very erratic on the tree, often showing on a few branches only. Considerable stunting and decline were also observed, as well as the necrosis of many buds causing stripping and scarce renewal of branches. Peach trees with PNRSV developed a scattered mosaic pattern, with yellowing of leaf blade and large yellow or creamy spots were moreover observed on a large proportion of the tree canopy.

PDV was identified on young peach orchards, with 7 positives collected from central wilayates. Tree symptoms consisted of rosettes of small leaves, located on one or two scaffolds with some rosettes showing heavy chlorotic spots. ACLSV was identified in 5 samples collected in central wilayates on apricot and peach. ELISA tests carried out at ITAF identified 5 samples with PPV. However, supplementary tests at INRA laboratories in Montpellier (France) have not confirmed our results.

Other stone fruit virus assays (Belhadj, 1990; Bousalem, 1992) have reported presence of: PPV, PDV, PNRSV and ACLSV.

Based on previous research (Table 1), the most widespread viruses were PDV and PNRSV. ACLSV was more limited in geographic distribution. PPV has been reported only by Bousalem (1992). Further studies are currently under way at the National Institute of Plant Protection (INPV) to monitor for PPV.

Table 1. Stone fruits viruses in Algeria

Viruses	Species	Variety	Region	Serological test	Biological test	Reference
PPV	Peach		Eucalyptus, Sidi Moussa	+		Bousalem (1992)
PNRSV	Apricot		Ain Defla, Beni Tamou, Eucalyptus, Mouzaia, N'Gaous, Sidi Moussa	+	+	Belhadj (1990) Bousalem (1992) Mahfoud (1991)
	Peach	Red top				
PDV	Peach	Fayette, Red top	Babsia, Beni Tamou, Bir Mourad Rais, Blida, Eucalyptus, Mouzaia	+	+	Belhadj (1990) Bousalem (1992) Mahfoud (1991)
ACLSV	Apricot Peach		Eucalyptus, Koléa, Sidi Moussa	+		Bousalem (1992)

CONCLUSIONS

As a consequence of the new economic course of the country, rosaceae orchards have rapidly evolved in Algeria over the last few years to a more intensive system, with technical and economic trends of modern farms.

This new system of production has engendered a few modifications, from the sanitary point of view, in the relationship between pests and their hosts. Moreover, both the habit of importing new varieties from abroad without adequate sanitary controls and the practice of top grafting carried out without supervision, are considerable risks fostering the dissemination of diseases.

Virus and decline diseases have had a severe economic impact. They may rapidly cause epidemics that are very difficult to control due to their varying mode of transmission. It is therefore mandatory to carry out a sanitary assessment of our orchards, by means of strict identification techniques.

It is urgent to organise surveys in areas producing apricots, peaches and plums to assess the presence in our orchards of PNRV, PDV and CLSV, as well as the probable presence of Sharka.

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